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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,805	01/25/2006	Michael Stelter	002664-28	9700

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MCLEAN, VA 22102-8064

EXAMINER

SIDDIQUEE, MUHAMMAD S

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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08/14/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/565,805	Applicant(s) STELTER, MICHAEL	
	Examiner MUHAMMAD SIDDIQUEE	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 May 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,4-15 and 18-26 is/are pending in the application.
- 4a) Of the above claim(s) 15 and 18-24 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 4-14, 25-26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Applicant's amendment filed on 5/12/2009 was received. Claims 1 and 6 are amended and claims 2-3, 16-17 are deleted and claims 23-26 are added. Claim 24 depends from a withdrawn claim 15, however, it is not mentioned in the claims. Appropriate correction is requested.

Response to Arguments

1. Applicant's arguments filed 5/12/2009 have been fully considered but they are not persuasive. Applicant's argued that the process described in Bailey reference is uncontrolled which is not true. Bailey reference describes a method during the assembly of fuel cell system, steps comprising compressing a stack of fuel cell with a compression device, measuring the force exerted on the stack with a load monitoring device (force sensor), measuring the displacement of the stack in response to the applied force with a displacement monitoring device (distance sensor) and in conjunction with a controller to monitor and compare the signals from the monitoring devices and generates output signals representative of the displacement of the stack as a function of the force exerted thereon [pages 5-7; page 10, lines 1-23].

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. Claims 1 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rock (US 2003/0203269 A1) in view of Cisar et al (US 6,533,827 B1) and Bailey et al (WO 02/09216 A2).

Regarding claim 1, Rock discloses a method for producing a fuel cell stack by stacking a plurality of fuel cells arranged in a stacked configuration to form a fuel cell assembly and then compressing the fuel cell stack with a predetermined compressive load (controlled force) [Abstract; paragraph 0010-0011]. Rock fails to teach method of using change in the dimension of the stack (displacement) and joining and applying heat to the fuel cell. However, Cisar teaches a method for preparing a subassembly for an electrochemical cell comprising aligning a subassembly having two or more electrochemical cell components with one or more bonding elements disposed between the two or more electrochemical cell components (joining the cell stack) and then heating and compressing the cells to form the fuel cell stack [Abstract; column 2, lines 39-47]. Bailey discloses a method during the assembly of fuel cell system, steps comprising compressing a stack of fuel cell with a compression device, measuring the force exerted on the stack with a load monitoring device (force sensor), measuring the

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displacement of the stack in response to the applied force with a displacement monitoring device (distance sensor) and in conjunction with a controller to monitor and compare the signals from the monitoring devices and generates output signals representative of the displacement of the stack as a function of the force exerted thereon [Abstract, Fig. 1-2; pages 5-7; page 10, lines 1-23]. Bailey also teaches that the method may further comprise comparing the displacement measured at a given force to a reference displacement for that force. Compression of the stack may be interrupted when the measured displacement varies from the reference displacement by more than a predetermined threshold amount [page 5, lines 15-21]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the steps of joining and sealing the cell stack with heat as taught by Cisar and the teachings of using displacement monitoring device for measuring the stack change in displacement as taught by Bailey in the fuel cell stacking method of Rock in order to have gas tight sealing of the fuel cell and automating the process and thereby have less scraping during production.

Regarding claim 25, Bailey teaches that compression force is applied for sealing (tightness) a fuel cell stack and also to ensure sufficient electrical contact of the cells [page 3, lines 13-33]. Bailey further teaches that compression of the stack may be interrupted when the measured displacement varies from the reference displacement by more than a predetermined threshold amount [page 5, lines 15-21] in other words, when sealing (tightness) is achieved.

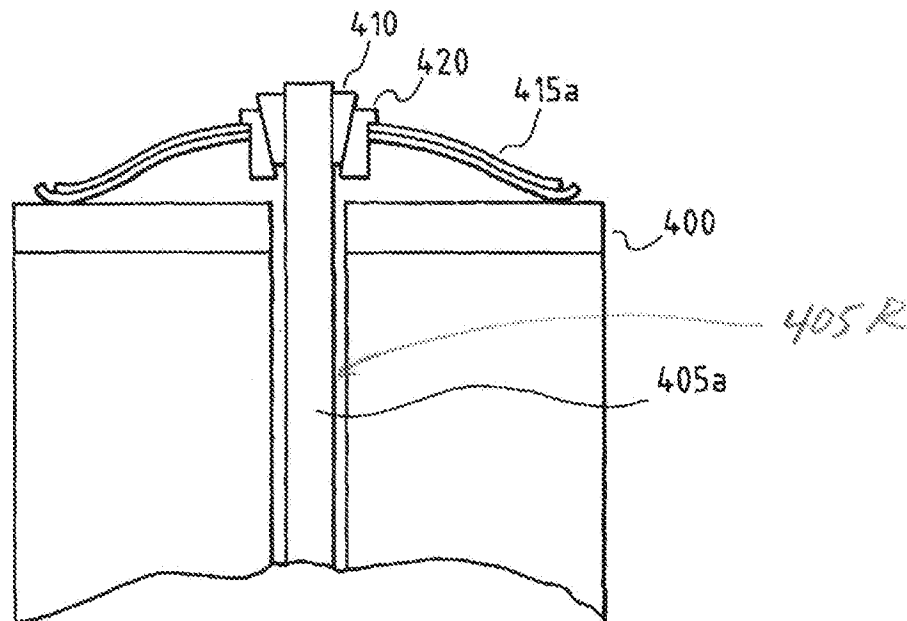
Regarding claim 26, Bailey teaches that the method may further comprise storing the contemporaneous data corresponding to the displacement at a given force in a database comprising statistical data corresponding to previously tested stacks, and comparing the contemporaneous data to the statistical data. An alarm signal may be sent to an operator or controller when the contemporaneous data indicates that the assembly process is not in statistical control [page 6, lines 18-28]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the concept of using previous process data and compare it for the control purpose as taught by Bailey in the fuel cell stacking method of Rock/Cisar in order to have efficient control and automating the process and thereby have less scraping during production.

5. Claims 4-5 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rock (US 2003/0203269 A1) in view of Cisar et al (US 6,533,827 B1) and Bailey et al (WO 02/09216 A2) as applied in claim 1 and further in view of Barton et al (US 6,190,793 B1).

Regarding claims 4-5 and 13, Rock/Cisar/Bailey remains silent about using a tension means with the compressive load. However, Barton teaches a method of stacking a fuel cell stack using combination of compressive force and tension means with a tension member (405a) (tie rod) which extends through a recess (405R) provided in the assembled fuel cell stack and which transmits the at least one controlled force component to the assembled fuel cell stack [Abstract; Fig. 3A]. Barton also teaches

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using wedges and collect (360, 350) (locking element) to secure the tension member (tie rod). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize a tension member and wedges and collect as taught by Barton in the fuel cell stacking method of Rock/Cisar/Bailey in order to compress and hold tight the assembled fuel cell stacks for effective sealing of the fuel cell assembly.

FIG. 3A

6. Claims 6-10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rock (US 2003/0203269 A1) in view of Cisar et al (US 6,533,827 B1) and Bailey et al (WO 02/09216 A2) as applied in claim 1 and further in view of Herrmann (US 2004/0081864 A1).

Regarding claims 6-10, Rock/Cisar/Bailey remains silent about checking the fuel cell assembly for gas tightness. Herrmann teaches a method of testing leakage of fuel cell for gas tightness for a single fuel cell or a stack of fuel cell assembly [paragraph 0015]. Herrmann also teaches performing leak test by introducing hydrogen (reducing gas) and nitrogen gas mixture to the fuel cell and measuring the pressure drop to detect possible leaks [paragraph 0013, 0016 and 0017]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the leak testing method as taught by Herrmann in the fuel cell stacking method of Rock/Cisar/Bailey, during and after joining steps, and repeat applying compressive force if necessary in order to ensure leak-free and gastight assembly of fuel cell stacks.

Regarding claim 14, Herrmann teaches that it is known in the art that testing of the fuel cell with fuel gas like hydrogen is performed in the testing chamber (gastight chamber) to avoid explosion [paragraph 0006]. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform joining and chemical forming steps in a gas tight testing chamber as taught by Herrmann in the fuel cell stacking method of Rock/Cisar/Bailey/Herrmann in order to ensure safe operation of stacking of fuel cell stacks.

7. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rock (US 2003/0203269 A1) in view of Cisar et al (US 6,533,827 B1), Bailey et al (WO 02/09216 A2) and Herrmann (US 2004/0081864 A1) as applied in claim 9 and further in view of Debe et al (US 2003/0041444 A1).

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Regarding claims 11-12, Rock/Cisar/Bailey/Herrmann remain silent about testing electrical serviceability of the fuel cell. However, testing of voltage and current of the fuel cell is a routine practice in the art. Debe teaches that membrane assembly of fuel cell is tested using hydrogen/oxygen gas flows applied to respective sides of the assembly and then voltage and current is measured and checked for electrical serviceability. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to utilize the voltage/current testing method as taught by Debe in the fuel cell stacking method of Rock/Cisar/Bailey/Herrmann in order to ensure electrical serviceability of the fuel cell stacks.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MUHAMMAD SIDDIQUEE whose telephone number is (571) 270-3719. The examiner can normally be reached on Monday-Thursday, 7:30 am to 4:00 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Muhammad Siddiquee/
Examiner, Art Unit 1795

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795